

# **COMELEC ADVISORY COUNCIL**

## **Post-Election Report on the Use of the Automated Election System (AES) in the 2010 National and Local Elections**

Submitted to the:  
**Joint Congressional Oversight Committee on  
Automated Election System**

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## I. Executive Summary

The automation of the May 2010 national and local elections was a very significant event that changed the face of Philippine politics. It was an incredibly ambitious project for the Commission on Elections (COMELEC), which had a small information technology (IT) department and did not even have a high level chief information officer (CIO). With over 50 million registered voters, 76,347 clustered precincts, and eleven simultaneous election races with up to 300 candidates per ballot, the Philippines did not seem to be the ideal candidate for automation elections.

From the beginning, the project faced numerous challenges. The COMELEC had to request a supplemental budget from Congress to purchase the automated election system (AES), because this was not included in the COMELEC's agency budget. The procurement also took longer than expected, because the COMELEC was not equipped to manage a procurement of this size and complexity. Even the contract signing experienced delays when the local partner of the winning consortium threatened to walk away. To top it all off, a group of "concerned citizens" filed a motion to stop the automation altogether. All of these events further tightened an already short timetable.

The implementation of the project encountered numerous obstacles as well. The most significant of these was the compact flash (CF) card configuration issue that was uncovered a week before the elections. Other issues involving the AES include transmission problems, deactivation of the ultraviolet ink-based ballot authenticity verification feature, and erroneous time stamps. There were also numerous complaints during Election Day, including long queues at polling precincts, defective precinct count optical scan (PCOS) machines or CF cards, and reports of electoral fraud, such as vote buying and ballot stuffing. What seemed so promising at the beginning of the project was suddenly becoming everyone's worst nightmare.

Then the results started coming in, first in trickles then in surges. By midnight on Election Day, 60% of the precinct results had been transmitted and by the following day, the percentage had risen to over 80%. Local candidates were proclaimed within 24 hours, senators were proclaimed within a week, and presidential and vice presidential candidates were conceding the elections even before the official canvass. The speed and transparency by which the precinct results were made available made it practically impossible for the results to be manipulated. All of a sudden, the voters seemed to have forgotten the ordeal they had gone through on Election Day.

While most people were celebrating the perceived success of the automated elections, many were finding reasons to discredit the AES. These detractors included losing candidates, self-proclaimed IT experts, and election operators that were put out of business. The evidence presented ranged from mere hearsay to wild speculation to videos of unidentified witnesses. Despite all the efforts of the detractors, they could not substantiate any claim of electoral fraud committed by the AES. The results of the Random Manual Audit are being eagerly awaited to finally either substantiate or debunk these claims.

The automation of the May 2010 elections was definitely not perfect. Smartmatic/TIM and COMELEC made mistakes throughout the entire process that gave people a reason to distrust the AES. However, the problems that arose were not



severe enough to allow interested parties to manipulate the election results. Despite all its shortcomings, the AES was still able to eradicate the most damaging form of electoral fraud—the *dagdag-bawas* (add-subtract). While the lessons to be learned from this exercise are many, the COMELEC Advisory Council believes that the Philippines is much better off with automated elections and that manual elections are now officially a thing of the past.

## II. Background of Election Automation in the Philippines

In the early stages of automating the elections in the Philippines, Republic Act (RA) No. 8046<sup>1</sup> was passed on 7 June 1995, paving the way for automation to be used in the counting and consolidation of election results nationwide and authorizing the Commission on Elections (COMELEC) to pilot-test such technology in the scheduled Autonomous Region in Muslim Mindanao (ARMM) Elections on 9 September 1996. Using 42 optical scanners provided by American Information System, the said pilot-test automation of the elections was relatively successful despite some setbacks due mainly to machine failure.

On 22 December 1997, Congress enacted RA 8436, authorizing the COMELEC to adopt an automated election system (AES) in the May 1998 national and local elections and onwards. In consonance with such mandate, the COMELEC again automated the elections in the ARMM using optical scanners during the May 1998 national and local elections. Problems were likewise encountered, particularly in the Province of Sulu, where it was found that while the automated machines functioned accordingly, the misprinting of the official, pre-printed ballots caused it to be misread by the machines due to the misalignment of the ovals opposite the names of the candidates, and the wrong sequence codes caused the rejection of ballots.<sup>2</sup>

The May 2001 elections were not automated, as there were no funds appropriated for that purpose by Congress and the apparent lack of time to prepare for such endeavor. Under Chairman Benjamin S. Abalos, Sr., the COMELEC made preparations to automate the May 2004 elections. To carry out the automation, the COMELEC acquired automated counting machines worth 1.3 billion pesos from Mega Pacific. Unfortunately, on 13 January 2004, the Supreme Court declared the election automation contract void due to “*violations of law and the glaring grave abuse of discretion committed by COMELEC.*”<sup>3</sup>

On 23 January 2007, RA 9369 was passed amending RA 8436 and once again authorizing the COMELEC “*to use an automated election system or systems in the same election in different provinces, whether paper-based or a direct recording electronic election system as it may deem appropriate and practical for the process of voting, counting of votes and canvassing/consolidation and transmittal of results of electoral exercises...*”

<sup>1</sup> Entitled “An Act Authorizing the Commission on Elections to Conduct a Nationwide Demonstration of a Computerized Election System and Pilot-test it in the March 1996 Elections in the Autonomous Region in Muslim Mindanao (ARMM) and for other Purposes.

<sup>2</sup> Loong Vs. COMELEC, G.R. No. 133676. April 14, 1999.

<sup>3</sup> Information Technology Foundation of the Philippines, et al. Vs. Commission on Elections, et al, G.R. No. 159139. 13 January 2004

Since RA 9369 was passed very close to the May 2007 elections, the law was drafted to provide for a partial automation of the May 2007 elections, stating “*that for the regular national and local election, which shall be held immediately after effectivity of this Act, the AES shall be used in at least two highly urbanized cities and two provinces each in Luzon, Visayas and Mindanao, to be chosen by the Commission... In succeeding regular national or local elections, the AES shall be implemented nationwide.*”

Despite the provision for a partial automation of the May 2007 election, the COMELEC Advisory Council (CAC), created by virtue of RA 9369 and headed by then CICT Secretary Ramon P. Sales, did not recommend the automation of the May 2007 elections, citing the following reasons: First, the readiness of the solutions provider; second, the readiness of COMELEC; and third, the lack of time, to set up the systems, train personnel and educate people on the new voting system (Annex A).

The COMELEC and the CAC then underwent changes in leadership as COMELEC Chairman Abalos resigned in October 2007 and was replaced by Chairman Jose A. R. Melo, and CICT Secretary Sales resigned in June 2007 and was replaced by Secretary Ray Anthony Roxas-Chua III. Under Secretary Roxas-Chua, the CAC recommended the automation of the 2008 ARMM elections as preparation for the automation of the May 2010 elections. The COMELEC proceeded to successfully automate the 2008 ARMM elections and was well-positioned to automate the May 2010 elections.

### III. Legal Framework

Section 8 of Republic Act No. 9369 mandated the creation of the COMELEC Advisory Council (CAC). Members of the CAC include the following:

	Name	Organization
Chairman:	Sec. Ray Anthony Roxas-Chua III	Commission on Information and Communications Technology
Government:	Usec. Fortunato T. dela Peña	Department of Science and Technology
	Asec. Geronimo L. Sy <sup>4</sup>	Department of Education
Academe:	Prof. Manuel C. Ramos, Jr.	University of the Philippines
ICT Professional Organizations:	Engr. Romulo R. Agatep <sup>5</sup>	Phil. Electronics and Telecommunications Federation
	Dep. Comm. Lilia C. Guillermo	CIO Forum
	Atty. Ivan John E. Uy	Phil. Computer Society
Non-governmental Electoral Reform Organizations:	Amb. Henrietta T. de Villa	Parish Pastoral Council for Responsible Voting
	Mr. Andie C. Lasala	Consortium on Electoral Reforms

As per Section 9 of RA 9369, the CAC has the following functions:

<sup>4</sup> Replaced Usec. Teodosio C. Sangil, Jr.

<sup>5</sup> Replaced Mr. Renato B. Garcia



1. Recommend the most appropriate secure, applicable and cost-effective technology to be applied in the AES, in whole or in part, at that specific point in time.
2. Participate as nonvoting members of the Bids and Awards Committee in the conduct of the bidding process for the AES. Members of the Advisory Council representing the ICT professional organizations are hereby excluded from participating in any manner in the Bids and Awards Committee.
3. Participate as nonvoting members of the steering committee tasked with the implementation of the AES. Members of the Advisory Council representing the ICT professional organizations are hereby excluded from participating in any manner in the steering committee.
4. Provide advice and assistance in the review of the systems planning, inception, development, testing, operationalization, and evaluation stages.
5. Provide advice and/or assistance in the identification, assessment and resolution of systems problems or inadequacies as may surface or resurface in the course of the bidding, acquisition, testing, operationalization, re-use, storage or disposition of the AES equipment and/or resources as the case may be.
6. Provide advice and/or assistance in the risk management of the AES especially when a contingency or disaster situation arises.
7. Prepare and submit a written report, which shall be submitted within six months from the date of the election to the oversight committee, evaluating the use of the AES.

Section 10 of RA 9369 provided for the establishment of the Technical Evaluation Committee (TEC) composed of the following representatives:

	<b>Name</b>	<b>Organization</b>
Chairman:	Dir. Denis F. Villorente	Department of Science and Technology – Advanced Science and Technology Institute
Members:	Comm. Angelo Timoteo M. Diaz de Rivera	Commission on Information and Communications Technology – National Computer Center
	Dir. Ester Villaflor-Roxas	Commission on Elections

As per Section 11 of RA 9369, the TEC “shall certify, through an established international certification entity to be chosen by the Commission from the recommendation of the Advisory Council, not later than three months before the date of the electoral exercise, categorically stating that the AES, including its hardware and software components, is operating properly, securely, and accurately, in accordance

with the provisions of this Act based, among others, on the following documented results:

1. The successful conduct of a field testing process followed by a mock election event in one or more cities/municipalities;
2. The successful completion of audit on the accuracy, functionality and security controls of the AES software;
3. The successful completion of a source code review;
4. A certification that the source code is kept in escrow with the *Bangko Sentral ng Pilipinas*;
5. A certification that the source code reviewed is one and the same as that used by the equipment; and
6. The development, provisioning, and operationalization of a continuity plan to cover risks to the AES at all points in the process such that a failure of elections, whether at voting, counting or consolidation, may be avoided.”

#### IV. Technology Recommendations

The successful automation of the 2008 ARMM elections served as primary input to the technology selection for the May 2010 elections. Consistent with the CAC’s recommendation, the COMELEC deployed two types of technologies in the ARMM: (1) direct recording electronic (DRE) technology for the province of Maguindanao and optical mark reader (OMR) technology for the rest of the ARMM.

To augment the experience gained in the 2008 ARMM elections as well as assist the CAC in the formulation of its recommendation for the 2010 elections, various vendor demonstrations/exhibitions and activities were further conducted, including:

- A. Election Technology Conference and Vendor Exhibition organized by International Foundation for Electoral Systems (IFES) and held on 17-19 November 2008. A total of thirteen (13) automated election technology providers participated in this event:
  1. Avante International Technology
  2. Bharat Electronics
  3. DRS Data Services
  4. DVS Korea
  5. Election Systems & Software
  6. Indra Sistemas
  7. Mega Data
  8. Miru Data Systems
  9. Scantron/Syrex
  10. Scytl
  11. Sequoia Voting Systems
  12. Smartmatic
  13. Unisyn Voting Systems



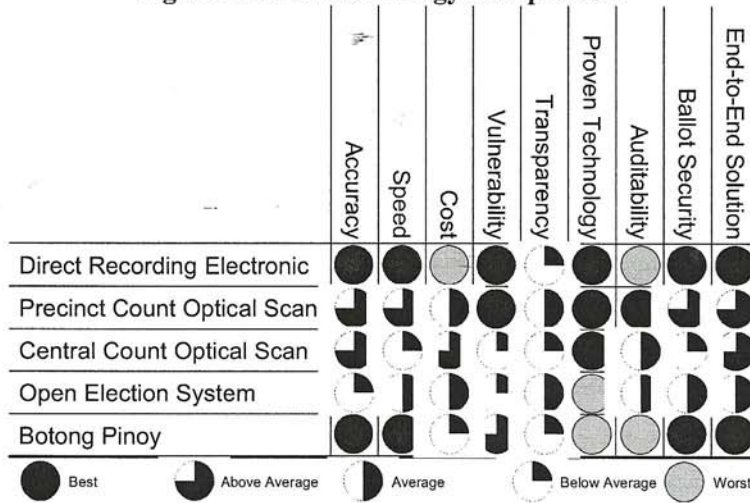
- B. Focus Group Discussion to determine user acceptability of various election technologies conducted by Parish Pastoral Council for Responsible Voting (PPCRV) and held on 19 November 2008 during the IFES event.
- C. AES vendor presentation to the CAC from 24 October 2008 to 9 March 2009. A total of eleven (11) solution providers presented to the CAC:
1. Gilat Satellite Networks
  2. Scytl
  3. Hart InterCivic
  4. Smartmatic
  5. Scantron
  6. Election Systems & Software
  7. DVS Korea
  8. DRS Data Services
  9. Sequoia Voting Systems
  10. Avante International Technology
  11. Open Election System
- D. Request for Information (RFI) issued on 15 December 2008 to solution providers on their Precinct Count Optical Scan (PCOS) and Central Count Optical Scan (CCOS) solutions. Fourteen (14) vendors out of twenty-six (26) responded.

Results of these activities assisted the CAC in formulating the recommendations to the COMELEC on the type of technology that will be utilized in the May 2010 elections. The available AES technologies could be summarized into three main categories plus two locally developed versions:

1. **Direct Recording Electronic (DRE)** is a technology wherein a vote is cast directly on a machine by the use of a touchscreen, touchpad, keypad or other device and the machine records the individual votes and calculates the vote totals electronically.
2. **Precinct Count Optical Scan (PCOS)** is a technology wherein an optical ballot scanner, into which optical scan paper ballots marked by hand by the voter are inserted to be counted, is located in every precinct.
3. **Central Count Optical Scan (CCOS)** is a technology wherein an optical ballot scanner, into which optical scan paper ballots marked by hand by the voter are inserted to be counted, is located in every voting center.
4. **Open Election System (OES)** is a technology that uses the traditional handwritten ballot, counts vote totals manually, and manually enters the results into a machine for consolidation.
5. **Botong Pinoy** is a technology similar to DRE, except it uses generic PCs with customized software as the voting machine.

The CAC compared the various AES technologies across many criteria, including accuracy, speed, cost, vulnerability, transparency, proven technology, auditability, ballot security, and end-to-end solution (Please see Figure 1).

**Figure 1: AES Technology Comparison**



On 28 November 2008, the CAC issued a resolution (Annex B) recommending that the COMELEC pursue a nationwide automation of the 2010 elections using direct recording electronic (DRE) technology or precinct count optical scan (PCOS) technology for all areas, subject to the election automation budget of the COMELEC, and central count optical scan (CCOS) technology for all areas not covered by DRE or PCOS technology.

Consequently, COMELEC issued on 26 January 2009 Resolution No. 8576 “Policy Issues in the Matter of the Automation of the May 10, 2010 National and Local Elections,” (Annex C) which resolves to pursue a nationwide automation of the 2010 elections using PCOS technology.

**V. Procurement Process**

**A. Procurement of AES**

**1. Preparation of Terms of Reference (TOR)/Request for Proposal (RFP)**

In its effort to assist the COMELEC in the preparation of the TOR/RFP for the automation of the 2010 elections, CAC and TEC members participated in the 3-day workshop on TOR/RFP preparation conducted by the COMELEC on 7-9 January 2009. Aside from the workshop, series of meetings were conducted with CAC, TEC, COMELEC officials and staff from January to March 2009 to finalize the TOR/RFP.

The CAC helped ensure that the TOR/RFP conformed to Section 7 of RA 9369, which prescribes the minimum system capabilities of the AES. In addition, data gathered from the RFIs were used to establish benchmarks to ensure the reasonableness of the TOR/RFP specifications.



The CAC submitted its recommendations on the draft RFP for the automation of the May 2010 elections through a letter dated 6 March 2009 and adopted by the COMELEC through Resolution 8591 dated 11 March 2009 (Annex D). The COMELEC issued the final TOR/RFP with the following three (3) major components:

Component 1: Paper-Based Automated Election System (AES)

- 1-A. Election Management System (EMS)
- 1-B. Precinct Count Optical Scan (PCOS) System
- 1-C. Consolidation/Canvassing System (CCS)

Component 2: Provision for Electronic Transmission of Election Results using Public Telecommunications Network

Component 3: Overall Project Management

Consistent with the implementing rules and regulations (IRR) of RA 9184, or the Government Procurement Reform Act, the TOR/RFP required that all prospective bidders must be at least 60% Filipino owned. However, given that no Filipino company had the proven capability to conduct nationwide automated elections, the CAC believes that this requirement should have been waived by the COMELEC.

## 2. Conduct of Bidding

As mandated by RA 9369, the CAC members, excluding those representing ICT professional organizations, participated as non-voting members of the COMELEC Special Bids and Awards Committee (SBAC).

Before the conduct of bidding, CAC issued on 6 February 2010 a resolution recommending various measures in promoting transparency in the conduct of bidding for the automation of the 2010 elections (Annex E).

The SBAC was established by the COMELEC on 11 February 2009, through Resolution No. 09-0121 (Annex F) for the acquisition of an AES to be used in the May 2010 elections. Subsequently, the Secretariat and Technical Working Group (TWG) were constituted to assist the SBAC.

The budget for the automation of the May 2010 elections had to be requested from Congress, because it was not included in the 2009 agency budget of the COMELEC. The approval of the budget required the passage of a law approved by both houses of Congress and signed by the President. The CAC actively participated in the discussions of COMELEC with the Senate and the House of Representatives on the budget requirements. President Gloria Macapagal-Arroyo also certified the bill as urgent.

On 23 March 2009, President Arroyo signed into law RA 9525 appropriating a supplemental budget of eleven billion three hundred one million seven hundred ninety thousand pesos (₱11,301,790,000.00) for the automation of the May 2010 elections.

On 13 March 2009, COMELEC SBAC posted the Invitation to Apply for Eligibility and to Bid for the automation of the May 2010 elections on COMELEC website, PHILGEPS website and leading newspapers (Annex G).

A total of ten (10) providers/consortiums bought the Request for Proposal for the 2010 Elections Automation Project. These are:

1. Avante International Technology
2. Indra Sistemas
3. Universal Storefront Services/Sequoia Voting Systems
4. Total Information Management/Smartmatic
5. Syrex/Scantron
6. AMA Group Holdings/Election Systems and Software
7. Gilat Satellite Network
8. Data Voting System/Samsung
9. All Data Hub
10. Mega Data

A pre-bid conference was held on 27 March 2009 attended by all the prospective bidders, the CAC, the media and other interested parties. The SBAC reset the deadline for the submission of bids and opening thereof from 27 April 2009 to 4 May 2009, due to clarifications on the bid documents as stipulated in Bid Bulletin No. 24 dated 24 April 2009 (Annex H).

Of the ten (10) prospective bidders who bought the RFP, only seven (7) bidders submitted their bid proposal/documents. The bid documents were opened in order of their submission on 4 May 2009, to wit:

1. Avante International Technology/Canon Marketing Philippines/DB Wizards/Netnode Technologies/Creative Point
2. Indra Sistemas/Strategic Alliance Holdings/Hart InterCivic
3. Sequoia Voting Systems/Universal Storefront Services/USSC-Sequoia Voting Solutions
4. Smartmatic/Total Information Management
5. Syrex/Amalgamated Motor Philippines/Avision
6. AMA Group Holdings/Election Systems and Software
7. Gilat Satellite Network/F.F. Cruz and Co./Filipinas Systems

After meticulous evaluation on the eligibility requirements of the submitted bids from 4-6 May 2009, all seven (7) bidders were declared as ineligible. The CAC felt that the SBAC may have been too stringent in applying the eligibility requirements which resulted in all bidders being disqualified. There were cases where the SBAC went above the requirements of the TOR and ruled ambiguities against the bidders<sup>6</sup>.

As a result, the CAC issued a resolution (Annex J) dated 11 May 2009, clarifying issues on ISO 9000 certification, parent/subsidiary relationships and import/export accreditation. In addition, the CAC also recommended that the SBAC afford the bidders the benefit of the doubt in the case of ambiguities.

<sup>6</sup> CAC Comments on the Conduct of Procurement by the Special Bids and Awards Committee, 8 June 2009 (Annex P)



This resolution was adopted by the SBAC, through Omnibus SBAC Resolution No. 09-001 (Annex K) and hence reconsidered four (4) bidders for further evaluation of eligibility requirements and opening of bid proposals subject to post qualification process. These were:

1. Indra Sistemas/Strategic Alliance Holdings/Hart InterCivic
2. Smartmatic/Total Information Management
3. AMA Group Holdings/Election Systems and Software
4. Gilat Satellite Network/F.F. Cruz and Co./Filipinas Systems

Upon the resumption of the evaluation of eligibility requirements, only two (2) bidders were able to satisfy the eligibility requirements and were qualified for further evaluation of their technical and financial proposals:

1. Indra Sistemas/Strategic Alliance Holdings/Hart InterCivic
2. Smartmatic/Total Information Management

Both the technical proposals of the two (2) remaining complying bidders were declared qualified. However, upon opening of the financial proposal of Indra Sistemas/Strategic Alliance Holdings/Hart InterCivic, they were disqualified per SBAC Resolution No. 010, dated 19 May 2009 (Annex L) for submitting a bid that proposed 57,231 PCOS machines, which was way below the required 82,200 PCOS machines. This was clearly a non-responsive bid that deserved immediate disqualification.<sup>7</sup>

In its Omnibus SBAC Resolution No. 09-002, dated 26 May 2009 (Annex M), the consortium of Smartmatic/TIM was declared as the bidder that has submitted the single complying calculated bid. This resolution further ordered that the consortium undergo post-qualification proceedings and technical evaluation of all systems, including an end-to-end demonstration.

After the technical/systems evaluation and post qualification conducted by the TWG on 27-30 May 2009, the SBAC declared the joint venture of Smartmatic/TIM as the "Lowest Calculated Responsive Bid" with a bid of seven billion one hundred ninety-one million four hundred eighty-four thousand seven hundred thirty-nine and forty-eight centavos (₱7,191,484,739.48) and subsequently recommended to the COMELEC En Banc to grant the Notice of Award to the aforesaid joint venture. On 10 June 2009, the Notice of Award (Annex N) was issued to Smartmatic/TIM.

On the whole, the entire bidding process was conducted with a high level of transparency and SBAC decisions were generally consistent and did not favor or discriminate any particular bidder. SBAC proceedings were attended by the bidders, CAC and TEC members, the media, and official observers from the Office of the Ombudsman, Commission on Audit, Procurement Watch, Transparency and Accountability Network, PPCRV and National Movement for Free Elections (NAMFREL), and the general public. CAC members, as non-voting member of the SBAC, and the official observers were given a copy

<sup>7</sup> CAC Comments on the Conduct of Procurement by the Special Bids and Awards Committee, 8 June 2009 (Annex I)

of the bid documents for examination and were allowed to submit written manifestations relating to the documents under examination.

### 3. Evaluation of Technical Proposals

On 27-30 May 2009, the technical proposal of Smartmatic/TIM underwent a systems evaluation and end to end demonstration to ascertain its responsiveness based on the twenty-six (26) criteria set in the RFP.

As found by the SBAC in its Memorandum dated 3 June 2009, and approved by COMELEC Resolution No. 8608, the Smartmatic/TIM-proposed AES systems and machines was able to comply with all the tests. Annex O details the corresponding answers/remarks to each of the twenty-six (26) individual items as appearing in the SBAC-TWG report.

On the requirement for the system to count the voter's vote as marked on the ballot with an accuracy rating of at least 99.995%, there were two (2) rounds of testing conducted. The test required 20,000 valid marks/shades using 625 ballots with 32 marks/shades each and with only one (1) allowable reading error.

The first round of test yielded 100% accuracy. However, during the comparison of the PCOS-generated results with the manually pre-determined results, it was discovered that there were seven (7) marks inadvertently missed by the members of the TWG during the ballot preparation. Although the test was considered accurate, the 20,000-mark threshold was not met thereby requiring the test to be conducted again. For the second round of testing, the test utilized 650 ballots with a total of 20,800 marks, which again resulted to 100% accuracy.

On the requirement for the system to have an alternative power sources, which will enable it to fully operate for at least twelve (12) hours, there were also two (2) tests conducted. The initial test had to be repeated due to smoke emitted by the PCOS after seven (7) hours of operation. As explained by the Smartmatic/TIM, the incident was caused by the use of an undersized wire to connect the battery to the PCOS, which was later confirmed by two (2) COMELEC electricians. Prior to the second test of the battery, the PCOS machine was connected to the regular power source and the machine started up successfully. The second test of the alternative power source was completed in twelve (12) hours and forty (40) minutes, starting from the initialization to the printing of reports. Ballots were fed into the PCOS machine during the test.

In the CAC Observation report on the conduct of bidding submitted to COMELEC, the CAC deemed that the SBAC ruled correctly when it gave Smartmatic/TIM another opportunity to demonstrate the battery life of the system and the incident was not a sufficient justification to disqualify the proposal.

As per the request of the COMELEC, the CICT's National Computer Center (NCC) and the DOST provided two (2) technical staff each to assist the



COMELEC SBAC TWG in the evaluation of the equipment and systems provided by the bidders.

#### **4. Contract Preparation**

The CAC members participated in the review and preparation of the contract together with the team of Dir. Ferdinand Rafanan of the COMELEC Legal Department, legal team of Smartmatic/TIM, representatives of the Office of Ombudsman and PPCRV, and former Justices of the Supreme Court Hugo Gutierrez Jr. and Angelina Sandoval Gutierrez.

Prior to the signing of contract between COMELEC and the joint venture of Smartmatic/TIM, it was reported that TIM informed the COMELEC of their intention to withdraw from the partnership with Smartmatic. Accordingly, CAC issued a resolution (Annex P) on 30 June 2009 recommending that COMELEC proceed with the automation of the May 2010 elections with Smartmatic using whatever legal means available, as there was no sufficient time to conduct another round of public bidding.

After much discussion between the parties, with the intervention of COMELEC, both parties came to an agreement and signed the contract with COMELEC on 10 July 2009.

### **B. Other Procurement**

The CAC, despite being a non-voting member of the COMELEC Bids and Awards Committee as provided for in RA 9369, was only invited to participate in the bidding for the AES. There were numerous subsequent procurements related to the 2010 elections conducted by COMELEC wherein the CAC was not invited.

#### **1. Ballot Secrecy Folders**

The procurement of the ballot secrecy folders for the 2010 elections was surrounded by controversy and deservedly so. The ballot secrecy folders were grossly overdesigned and overpriced at 380 pesos each, for a total cost of 690 million pesos. Fortunately, the questionable procurement was exposed by the PPCRV and was cancelled by the COMELEC En Banc prior to contract signing. The COMELEC should conduct a thorough investigation on this questionable procurement and impose the necessary sanctions on individuals.

#### **2. Ballot Logistics**

Ballot logistics, including packing and delivery, was not included by the COMELEC in the TOR/RFP and this resulted in a subsequent procurement that cost the COMELEC an additional 686.3 million pesos. Due to time constraints, COMELEC had to forego an open bidding and instead resorted to direct contracting method of procurement with Noah's Paper Mills for the packing of official ballots and with Smartmatic for the tracking, transport and delivery of official ballots. While the ballot logistics of the project were generally successful with very few ballot delivery incidents, it raises questions on whether this procurement was done properly. A deeper analysis of the

procurement would need to be undertaken in order to determine any abuse of discretion on the part of COMELEC, but it would be in the COMELEC's interest to include this in the overall TOR/RFP in the future.

### 3. Ballot Boxes

The ballot boxes used in the 2010 elections were not included in the original TOR/RFP and this resulted in a subsequent procurement of 77,000 ballot boxes worth a total of 256 million pesos and ballot box transportation services worth 569.7 million pesos. There were also delays in finalizing the design of the ballot box due to discussions between the COMELEC and the CAC on whether the ballot box should have one or two compartments. The COMELEC decided to award the contract directly to Smartmatic in the interest of time and to ensure that the PCOS machines would fit on top of the ballot box. While a deeper analysis would be needed to determine if the ballot boxes or the ballot box transportation services were overpriced, it would be in the COMELEC's interest to include them in the overall TOR/RFP in the future.

### 4. Ultraviolet Lamps

The ultraviolet (UV) mark on the ballot was one of the AES's key security measures, because it prevented the use of fake ballots to manipulate election results. However, printing problems prevented the PCOS machines from recognizing the UV marks on the ballots on a consistent basis, causing the COMELEC to disable the UV mark reading feature of the PCOS machine. As a contingency, the COMELEC decided to purchase UV lamps that would be used to check for the ballot UV marks manually. The COMELEC eventually procured 80,000 UV lamps at 350 pesos each, for a total cost of 30 million pesos. While it has not been ascertained whether these UV lamps were overpriced, since it was Smartmatic/TIM's shortcomings that resulted in the need for UV lamps, Smartmatic/TIM should be made to shoulder the cost of the UV lamps.

## VI. Certification of the Automated Election System (AES)

### A. Overview of the AES

The AES is a full life cycle voting system, which enables a user to:

- Create election definitions
- Create multiple ballot styles
- Assign voting jurisdictions to individual PCOS devices
- Open polls
- Allow voters to cast ballots
- Close polls under the consensus of the pertinent BEI contingent
- Accumulate vote totals
- Print election results at the local level
- Transmit results to the appropriate municipal canvass and consolidation system
- Transmit results to the Central Server system
- Accumulate vote totals at each reporting level



- Perform Auditing throughout the voting system

The AES, as well as the accessory applications of the Election Programming Station tool and the Ballot Production Tool, is made up of the following components:

#### **1. Election Management System (EMS)**

The EMS is used to create all the base components of an election definition. The application has the ability to either create election components singularly using a manual input interface, as well as a more automated way, in which files containing many individual components are able to be imported by the system and laid out into the systems database structure.

The application makes the needed associations of offices, candidates, parties, and contests to create the election. The EMS outputs data files that are used to customize each CCS within the voting system, as well as creating output files that contain the data that is needed by the EED to create the election's ballot styles, compact flash cards which are customized for each PCOS used in the election, as well as iButtons that are needed by poll workers to access the PCOS.

#### **2. Election Event Designer (EED)**

The EED uses a data import tool, which is customized with an accompanying template, to take output data from the EMS and load into the database. The EED primary functions include the creation of all ballot styles used in the election, creation of the data that will be used by each individual PCOS in each voting jurisdiction as well as the accompanying iButton for the PCOS.

#### **3. Election Programming Station (EPS)**

The EPS is simply a mass production tool to create compact flash cards and their associated iButton. The EPS connects to the EED database and pulls the needed information to update up to 20 compact flash cards per batch, at one time.

The actual process consists of a compact flash card being written to, then the associated iButton being flashed. Then the next compact flash card is updated with its associated iButton. This process continues until the batch is finished. Then, a new set of cards is loaded into the readers and the process continues.

#### **4. Ballot Production Tool**

The Ballot Production Tool is designed to mass configure USB thumb drives, uploading data relevant to particular thumb drives, which in turn are associated to particular voting jurisdictions' CCS applications. The name of this application is misleading as it does not play a role in ballot production.

## 5. Precinct Count Optical Scan (PCOS)

The PCOS is the ballot/vote counting device implemented within the AES. Each PCOS is customized with a compact flash card and an iButton so that only ballots specific to the particular polling place can be successfully scanned. Ballots are scanned through the PCOS, which reads the markings made by the voter onto the ballot and interprets the positions of the markings on the ballot, assigning a vote to the appropriate candidate for a given contest as the marking indicates.

When the polls are closed, the PCOS prints reports detailing the accumulation of votes for each candidate on the ballot and transmits the results to the appropriate municipal Consolidation/Canvassing System.

## 6. Consolidation/Canvassing System (CCS)

The CCS is the application that is responsible for the accumulation and tallying of vote data from the individual PCOS devices, as well as generating reports of the results. The CCS is implemented in several configurations, at the municipal level, the provincial level, the national level and at the central server level.

At the municipal level, the CCS accumulates the votes and generates results for that level, then creates and transmits provincial and national level results in a COC to the provincial level CCS, to which it is associated in the election.

At the provincial level, the CCS accumulates the votes and generates results for that level, then creates and transmits national level results in a COC to the national level CCS.

At the national level, the CCS accumulates the votes and generates results for that level.

At the central level server, the CCS receives all results from the different reporting levels and generates a running tally for COMELEC's internal monitoring purposes.

## B. AES Certification

COMELEC invited four (4) International Certification Entities as recommended by the CAC, through a resolution issued on 18 August 2009 (Annex Q), to submit their proposals for the AES Certification:

1. iBeta Quality Assurance
2. SysTest Labs
3. Wyle
4. CIBER

iBeta Quality Assurance, SysTest Labs and Wyle participated in the bidding. Based on the technical evaluation conducted by CAC and TEC, iBeta Quality



Assurance and SysTest Labs were deemed tied (Annex R), but when the cost was considered, SysTest Labs won the bidding.

SysTest Labs audited the source codes of: (a) PCOS firmware, (b) EMS applications, (c) CCS applications, and (d) miscellaneous utilities, such as the digital signature generator/comparator.

In addition, SysTest Labs conducted the following tests:

1. Complete system
  - 1.1 Vendor documentation review
  - 1.2 Functional and physical configuration audit
  - 1.3 Systems integration test
  - 1.4 Reliability and accuracy test
  - 1.5 Security test
  - 1.6 Volume test
  - 1.7 Stress test
  - 1.8 Electronic transmission/communication test
2. PCOS
  - 2.1 Environmental hardware test
    - 2.1.1 Bench handling
    - 2.1.2 Humidity and storage
    - 2.1.3 Dust
    - 2.1.4 Rain drip
    - 2.1.5 High temperature
  - 2.2 Electrical hardware test
    - 2.2.1 Power disturbance/variation
    - 2.2.2 Electrical fast transient
    - 2.2.3 12-hour battery
    - 2.2.4 Electrostatic susceptibility
    - 2.2.5 Lightning surge
    - 2.2.6 Conducted RF immunity

SysTest Labs also provided recommendations on COMELEC's field test and mock election plans.

The audit was conducted in accordance to the requirements of: (a) RA 9369 and RA 8436 as amended, and (b) portions of the US Election Assistance Commission (EAC) Voluntary Voting System Guidelines (VVSG) 2005 relevant to requirements of RA 9369 and RA 8436, as amended.

As provided for in RA 9369, the TEC should issue the AES Certification not later than three (3) months before Election Day, or not later than 10 February 2010 for the May 2010 elections. Not all certification tests were completed by the deadline, hence on 9 February 2010, the TEC issued its Resolution No. 2010-001 (Annex S) stating that the COMELEC can continue with the preparations for the May 2010 elections as all test results as of that date provided no reason to preclude the use of the AES. All of the certification tests were finally completed on 20 February 2010 by SysTest Labs.

In addition to the SysTest Labs' final certification test report, the TEC reviewed and revised COMELEC's Continuity Plan, as well as prepared the Validation and Verification Procedure and the Compensating Controls, for adoption by the COMELEC.

On 9 March 2010, the TEC issued Resolution No, 2010-002 (Annex T), which provides for the certification of the AES as required under Section 11 of RA 9369.

## **VII. Field Tests and Mock Elections**

The first field test was conducted on 27 January 2010 in ten (10) precincts across six (6) locations: Benguet, Pateros, Taguig, Naga, Cebu and South Cotabato. The second field test was conducted on 29 January 2010 in four (4) precincts in Pateros and Taguig. Taguig and Pateros were specifically chosen due to the nuances of the congressional races there, with the congressional district of Pateros including some *barangays* of Taguig City. The mock elections were conducted on 6 February 2010 in nine (9) precincts across five (5) locations: Quezon City, Taguig, Baguio, Cebu and Davao. The field tests and mock elections were observed by field monitors and volunteers of PPCRV, CER, and members of the TEC in selected areas.

Despite reports of numerous glitches during the field tests and mock elections, the COMELEC declared them a success. The glitches reported were centered primarily on transmission problems and rejections of ballots by the PCOS machines. There were also other reports on the poor dissemination of the schedule of the field tests and mock elections and the inadequate preparation of Smartmatic/TIM technicians and BEIs to handle the glitches. The CAC was not overly concerned with the glitches encountered during the field tests and mock elections, since these tests were specifically conducted to uncover any problems so they could be addressed.

## **VIII. Best Practices that Contributed to the Success of the Automated Elections**

### **A. Transparent Procurement Process**

As recommended by the CAC, the procurement of the AES was conducted with unprecedented transparency. This resulted in a high number of interested bidders and a winning bid that was 4 billion pesos less than the election automation budget. The benefits of a competitive bidding process can only be realized if the process is truly open and transparent, so it is highly recommended that future procurements of AESs be conducted in the same transparent manner.

### **B. Large, Established Vendor**

The foreign partner of the winning bidder, Smartmatic, is a very established election technology vendor that has done elections in many countries around the world, including the USA. It had a very large, established business and a strong reputation to protect, so it simply could not afford to fail. This was particularly evident during the CF card glitch, where Smartmatic did everything humanly possible to replace each of the 76,347 CF cards within a week. Smartmatic would also not be susceptible to bribes in exchange for rigging the elections, because it would simply lose too much in terms of the total contract value and future business opportunities. For a process as important and hotly contested as the



elections, the worst thing COMELEC could do is hire a vendor who has nothing to lose and can easily be compromised.

### **C. Availability of Precinct Results on the Internet**

One key feature of the AES was the real-time public website that displayed precinct results immediately after they were transmitted to the COMELEC central server. This feature was not required by RA 9369, but was recommended by the CAC to be included in the TOR/RFP and reiterated in its resolution issued on 30 October 2009 recommending measures in promoting transparency in the implementation of the AES (Annex U).

Within minutes of the closing of polls, the precinct results were made immediately available on the Internet and this brought unprecedented transparency in the election results. Because the results were made publicly available, it was practically impossible to change them without being noticed. It also allowed third parties to conduct their own running tallies, giving voters a better idea on which candidates were leading their respective races. The only challenge was getting 100% of the results online, because many precincts did not have transmission coverage. The update of online results concluded with only 90% of the precinct results. This could be avoided in the future by working with the telecom operators to ensure 100% transmission coverage of precincts.

## **IX. Major Problems/Issues Encountered**

### **A. AES Related Issues**

#### **1. Compact Flash Card Configuration**

On 3 May 2010, during final testing and sealing (FTS) one week before Election Day, a problem with the configuration of the compact flash (CF) cards was uncovered. The problem concerned the local side of the ballot that contained the local positions. Because the national side was full due to the party list candidates and the local side was relatively empty with just the local candidates, COMELEC made the decision to make the local side of the ballot double spaced. Unfortunately, Smartmatic/TIM did not configure the CF cards to treat the local side as double spaced. As a result, some positions were not read by the PCOS machines during FTS, which greatly alarmed candidates and poll watchdogs.

Smartmatic/TIM immediately identified the cause of the problem and assured the COMELEC that they could reconfigure and replace all 76,347 CF cards before Election Day. This involved the purchase of additional CF cards from abroad, because retrieving all CF cards from the PCOS machines in the field would take too long. While the vast majority of CF cards were replaced in time for the opening of polls on Election Day, a certain number of precincts did not get them on time. This resulted in delays in the conduct of polls and exacerbation of the problem of long lines at the precincts.

While the CF card issue was adequately addressed by Smartmatic/TIM for the most part, it gave voters a reason to doubt the integrity of the AES. Many

detractors were using the CF card issue to question the results of the elections, even though there were no substantiated cases of electoral fraud resulting from the CF card configuration glitch. This is a type of deficiency that will be difficult to measure in terms of penalties, but COMELEC should penalize Smartmatic/TIM to the fullest extent for this error.

## 2. Transmission Issues

Even during the early part of the implementation phase, the COMELEC and Smartmatic/TIM already knew that transmission was going to be a challenge on Election Day. The problem lay with the available telecom infrastructure that did not sufficiently cover all precincts with the required level of service. The type of service required for data transmission was general packet radio service (GPRS), which only covered approximately 70% of the precincts.

To cover the balance, COMELEC and Smartmatic/TIM purchased satellite based communications solutions, including very small aperture terminal (VSAT) systems and Inmarsat's Broadband Global Area Network (BGAN). However, despite the use of these satellite solutions, some precincts still did not have transmission coverage and had to resort to contingency measures. This involved manually transporting the CF card with the election results to the municipal canvassing center for direct upload. These transmission problems resulted in some servers not receiving all precinct results. On the part of Smartmatic/TIM, while the transmission coverage was beyond their control, they did sign a contract with COMELEC guaranteeing 100% transmission capability, so they should be penalized for the shortfall.

There were also fears that unscrupulous individuals might resort to using wireless signal jammers to interfere with the transmission of election results. Relative to this, the CAC issued a resolution on 5 February 2010 recommending that COMELEC declare the possession, manufacture, importation, sale, and use of wireless signal jammers as an election offense (Annex V).

The transmission of results was further complicated by the decision of the COMELEC to deploy a CCS laptop at each canvassing center instead of one central CCS server. This meant that precinct results had to be transmitted to the municipal CCS laptop, whose connectivity was not as reliable as the central data center, for official canvassing. It also made the CCS more susceptible to tampering, because it was distributed across all CCS laptops instead of just one CCS server. The CCS would have been better implemented as one central CCS server that consolidates all the data and the BOCs merely download the data from the central CCS server for official canvassing.

## 3. Ultraviolet Mark

The ultraviolet (UV) mark on the ballot was the key security feature of the AES to ensure the authenticity of ballots. However, printing problems prevented the PCOS machines from recognizing the ballot UV marks on a consistent basis, causing the COMELEC to disable the UV mark verification feature of the PCOS machine. Further exacerbating the problem, COMELEC



made the decision to change the UV mark from the Smartmatic design to the National Printing Office (NPO) design, which removed any possibility of turning the feature back on even if the printing problems were resolved, because the PCOS machines would not be able to recognize the NPO mark.

The CAC was deeply concerned with this development as the UV mark is the primary verification tool for detecting fake ballots and turning it off may result in the acceptance of fake ballots in the PCOS machines. As a result, the CAC issued a resolution on 1 March 2010 (Annex W) recommending measures to make sure that the authenticity of ballots is not compromised.

As a contingency, the COMELEC decided to purchase UV lamps that would be used by BEIs to check for the ballot UV marks manually. Unfortunately, possibly due to either poor dissemination of instructions by COMELEC or negligence on the part of BEIs, there were many reports of precincts not using the UV lamps to verify the UV marks on the ballots. This was not an entirely surprising result, because this was precisely the danger of adding human intervention to the process.

Despite this apparently significant security breach, the CAC believes the flaw was not capable of producing massive electoral fraud. For one thing, the ballot is of a very unusual size and weight, so it would be quite difficult to replicate. Secondly, each ballot can only be read once by the PCOS machine, so if a duplicate is somehow accepted, the original one will become an invalid ballot. That said, Smartmatic/TIM should still be penalized for this major deficiency, including covering the cost of the UV lamps purchased by COMELEC.

#### **4. Time Stamps**

A key security feature of the AES is the audit log, which records all the activities performed by the PCOS machine. This will expose any attempt to manipulate the operation of the PCOS machine. Each event is recorded in the audit log with a corresponding time stamp based on the PCOS machine's internal clock. Unfortunately, a number of PCOS machines reported questionable time stamps, some dating back months before Election Day. This invited allegations of fraud, because it appeared transmissions were done on days other than Election Day.

Smartmatic/TIM attributed the wrong time stamps to inaccurate internal clocks in the PCOS machines, caused by either a loss of battery that resulted in a reset of the clock or incorrect configuration during production. The time stamps could be reconciled by matching the transmission send time of the PCOS machine with the transmission receive time of the central server and working backwards. While the CAC believes the time stamp issue did not significantly undermine the integrity of the AES, it gave voters another reason to doubt the system and Smartmatic/TIM should be penalized accordingly.

#### **5. Final Testing and Sealing Results**

During final testing and sealing (FTS), the PCOS machines generated results for the ten (10) test ballots. Unfortunately, there were cases on Election Day in

which these results were uploaded to the CCS instead of the actual precinct results. The TEC and Smartmatic/TIM determined that this was caused primarily by BEIs not following the procedures for FTS, such as attempting to transmit during FTS and directly uploading to the CCS on Election Day without attempting to transmit. Approximately 262 clustered precincts in 177 municipalities accounting for 186,275 votes were affected by the FTS issue.

Since the error was relatively easy to spot and the affected votes were very minimal, the CAC does not consider this a major issue. However, it still caused the COMELEC some embarrassment, because the COMELEC had to recall some of its proclamations at the local level. Because local proclamations happened so fast, many local positions had already been proclaimed by the time the FTS issue surfaced. The vote differentials in local races are also relatively small, so even one precinct with the FTS issue could affect the outcome. To prevent this in the future, the AES must simply be configured to not allow these types of mistakes to be committed by the BEIs.

A side issue to the FTS issue was the decision by the COMELEC to allow Smartmatic/TIM to rectify the FTS issue directly by making changes in the CCS. This was strongly opposed by the CAC, because this would introduce manual intervention to the CCS database and compromise the integrity of the CCS. On 13 May 2010, the CAC issued a resolution (Annex X) to COMELEC recommending manual reconciliation of precincts affected by the FTS issue. Unfortunately, the decision had already been made by COMELEC and implemented by Smartmatic/TIM. While the impact was relatively minimal, it was still an intrusion into the AES that the CAC felt was unnecessary.

## 6. Hardware Failure

As with any major IT project, hardware failure is always a consideration. That is precisely the reason the COMELEC leased additional machines from Smartmatic/TIM. The original plan was to order 82,200 machines for 80,000 precincts, representing an excess of 2.75%. This was based on the experience from the 2008 ARMM elections, where less than 1% of the machines were defective. When the COMELEC further clustered the precincts down to 76,347, the excess increased to over 7%. On Election Day, a total of 450 PCOS machines failed, representing a failure rate of 0.6%, far below the 2.75% estimate of the COMELEC and the CAC. In addition, only four (4) CCS laptops out of 1,717 failed, representing a failure rate of 0.2%.

## 7. Replacement of Defective CF Cards

The distribution of CF card writers to COMELEC personnel in the field was a contingency measure that was viewed with suspicion. The move was proposed by the TEC to speed up the replacement of damaged/defective CF cards on Election Day. While the intentions were noble, the process was not well documented or publicized, thereby inviting allegations of impropriety. Like the CF card reconfiguration issue, no cases of electoral fraud related to this issue have been substantiated.



## 8. Thermal Paper

The election returns from the precinct were printed on thermal paper by the PCOS machine. Thermal printing is known to be susceptible to fading, but new thermal printing technologies have extended the life of thermal print. The TOR/RFP requires that the printed documents remain legible for at least five years. Reports of faded election returns (ERs) have raised concerns that the printer specifications may not have been met. If that is the case, Smartmatic/TIM should be penalized for using a non-compliant printing technology.

There have also been reports that some PCOS machines ran out of thermal paper for printing the election returns. Some precincts even resorted to using whatever thermal paper they could find, including thermal paper used for credit card receipts, which consequently raised questions on the authenticity of the copies of the ERs distributed to the stakeholders. COMELEC explained that the depletion of thermal paper in some precincts was brought about by accidental over-printing of copies of the ERs by BEIs. Smartmatic/TIM should have properly anticipated the printing requirements of the PCOS machines and provided for a buffer supply.

## 9. Rejection of Fake Ballots

The rejection of fake ballots was a contentious issue that required several meetings between the COMELEC En Banc and the CAC to finally resolve. The COMELEC wanted the AES to accept fake ballots and divert them into a separate compartment in the ballot box. The CAC strongly opposed this view, because it felt allowing the machine to determine ballot authenticity out of the voter's view could undermine the integrity of the AES. As a result, the CAC issued two resolutions on 13 February 2009 and 18 August 2009 (Annex Y) recommending that fake ballots be rejected outright. This issue also delayed the production of the ballot boxes, because the number of compartments had to be decided for production to begin.

After several meetings with the COMELEC En Banc, the CAC managed to convince the COMELEC to adopt its recommendation. However, the victory of the CAC was short-lived as the COMELEC eventually decided to turn off the UV mark verification feature of the PCOS, which would allow fake ballots into the AES.

## 10. Source Code Review

Section 12 of RA 9369 mandates that "*once an AES technology is selected for implementation, the Commission shall promptly make the source code of that technology available and open to any interested political party or groups which may conduct their own review thereof.*" On 29 January 2010, in response to COMELEC's request, the CAC and TEC issued a joint resolution (Annex Z) recommending the guidelines for the source code review. COMELEC subsequently prepared a room with two (2) computer terminals in the Project Management Office (PMO) for the conduct of such review.

There were complaints that the source code should have been released earlier, but the CAC feels the timing was reasonable given the source code was not completed until February 2010. There were also complaints that the guidelines were too restrictive. The CAC and TEC did not recommend the source code be allowed to be taken out of the COMELEC premises because: (a) it would violate the intellectual property rights of Smartmatic/TIM and (b) it would make it easier for computer hackers to exploit vulnerabilities in the system, if any. In the end, only two (2) organizations formally submitted their intent to conduct the source code review and none actually did.

## **B. Non-AES Related Issues**

### **1. Long Lines**

Probably the most common complaint on Election Day was the long lines at the precincts that dampened the enthusiasm of the voters. The most obvious culprit was the clustering of precincts that increased the maximum number of registered voters per precinct from 200 to 1,000. Further examination determined that it was not the AES that was serving as the bottleneck but the verification of voter identity. It appeared COMELEC overclustered without providing the necessary manpower complement to handle the increase in number of registered voters. Fortunately, the majority of voters remained patient and withstood the long lines. In the next election, COMELEC should probably decrease the clustering and provide more manpower at the precinct.

### **2. Lack of Time**

Many detractors criticize the COMELEC for not having allocated sufficient time to prepare for the May 2010 elections. To be fair, the COMELEC and the CAC began working on this immediately after the conclusion of the 2008 ARMM elections. There were just numerous delays throughout the entire process, including the release of the budget, procurement process, contract signing, and the Supreme Court case filed by certain groups to stop the automation. Some of them were within the control of the COMELEC, but some were not. In the future, it might be advisable to have separate teams within COMELEC focused on the 2011 ARMM elections and the May 2013 elections, so work on the May 2013 elections can begin immediately.

### **3. Ballot Stuffing**

One type of electoral fraud that the AES was susceptible to was ballot stuffing, since the issuance of ballots to voters still involved human intervention. This could occur either by the filling out of unused ballots at the end of Election Day or by the pre-shading of ballots, particularly in controlled precincts. Unfortunately, as long as the identity verification step is not automated, this type of fraud will continue to persist. One way to eradicate this problem is to complete the biometric registration of voters. To accomplish that, the COMELEC would need to have a law passed allowing them to conduct a general registration for voters that have not completed biometric registration.



#### 4. Vote Buying

Since the AES had all but eradicated the *dagdag-bawas* (add-subtract) form of electoral fraud, it appeared that many cheaters resorted to vote buying instead. Reports of vote buying were very rampant on Election Day and amounts were rumored to be in the thousands per voter. Unfortunately, this is a form of electoral fraud that the AES simply cannot eradicate. As long as voters are willing to sell their right to vote for compensation, this type of fraud will continue to persist. The only way to eradicate this problem is for the COMELEC and law enforcement agencies to crack down on the vote buyers.

#### 5. Inaccurate Voter's List

Another common complaint that has persisted even in the manual elections is the inaccurate voter's list. There were many reports where voters were unable to find their names on the list and were thus unable to vote. Meanwhile, there are probably still many multiple registrants and deceased voters who have not been cleansed from the voter's list. To further exacerbate the problem, the COMELEC has not been very clear about how a voter is deactivated. This is another problem that can be addressed by a full implementation of biometric registration. Multiple registrants and deceased voters will immediately be purged. COMELEC should also better publicize how voters can verify their registration and what they should do if they are deactivated.

#### 6. Ballot Printing

During the course of the printing of ballots, Smartmatic/TIM came across ballot defects that could be rejected by the PCOS machines. The CAC was requested by the COMELEC to provide comments and recommendations on how to deal with the quality issues affecting the ballot printing, because reprinting all the defective ballots would adversely affect the printing schedule. On 19 February 2010, the CAC issued a resolution (Annex AA) recommending that COMELEC accept the printed ballots with cosmetic defects except in certain extreme cases. The time constraints were caused by the ballot printing having started late, but that was also due in part to the Supreme Court's intervention on the disqualification of candidates. In addition, Smartmatic/TIM should have anticipated problems on the ballot printing and provided contingency measures given the very tight schedule.

#### 7. Ballot Size

The official ballot, at 25 inches, is the longest ballot ever in Philippine history and poses unique challenges. Logistically, these ballots are much more difficult to print and transport to the precincts. At the precinct, the ballots also pose privacy issues as the ballot is difficult to conceal from other voters. It is a well known fact that the reason for the large ballot size was the party list system, which included 187 party list candidates. One possible solution would be to use a numerical system instead of listing all the party list candidates on the ballot. A shorter ballot would also be more environmentally friendly.

In addition, there were also reports of problems with the width of the ballot. Because the width of the ballot was an exact fit to the PCOS machine, any expansion due to moisture or any deviation of the paper supply from the specifications would result in the ballot not fitting in the PCOS machine. Smartmatic/TIM should have provided some allowance for the ballot width.

## 8. Data Center

Smartmatic/TIM encountered problems in their negotiations with the two major telecom operators with regard to the provision of the data centers. Proposals were requested from Globe Telecom and Philippine Long Distance Telephone (PLDT), the two largest data center providers in the country. Globe Telecom offered its MK2 facility, which meets the Tier 4 classification required by Smartmatic/TIM, as the main data center, while PLDT submitted an incomplete proposal without naming the data center they will provide as the backup data center.

PLDT eventually revealed that they would not be offering their Tier 4 Vitro facility due to security concerns and instead offered their facility in the Clark Export Processing Zone in Pampanga. This caused Globe Telecom to withdraw its offer to provide its MK2 facility and instead partner with a Clark-based data center. COMELEC and Smartmatic/TIM sent a delegation to Clark to evaluate the appropriateness of the data centers offered by both providers and found them to be below the requirements of the project.

After much deliberation, COMELEC and Smartmatic/TIM, with the assistance of the National Telecommunications Commission (NTC) and members of the CAC, managed to convince Globe Telecom to upgrade its UN Avenue Data Center in Manila to be the central data center. The backup data center was provided by PLDT through its Regalla Data Center in Quezon City. While the issue was eventually resolved, it nearly became a showstopper for the automated elections. These types of issues should be addressed by the vendor well in advance.

## C. Post-Election Day Problems

### 1. Null Votes

The issue of null votes became a major discussion point following the elections when it was revealed there were approximately 1 million null votes for President and 2.6 million null votes for Vice President. Null votes are votes that are not counted by the AES because: (a) the voter did not vote for any candidate (abstain); (b) the voter voted for less than the allowed number of candidates for that position (undervote); or (c) the voter voted for more than the allowed number of candidates for that position (overvote).

The CAC believes the null votes issue is a non-issue, because it is reasonable to expect that some voters will not vote for all positions and some voters will make a mistake and overvote. Null votes have existed in manual elections, but have not been tracked, because the manual system simply did not provide for it. To determine whether the null votes in the 2010 election are higher than



normal, the COMELEC can do a comparison with previous elections. In the event the AES erroneously nullified votes, this would be revealed in the random manual audit.

## **2. Lowering of Threshold**

There were no clear rules on the lowering of thresholds to facilitate early proclamations in local races. Some municipalities were quick to lower their threshold, while other municipalities refused to lower the threshold despite an insurmountable lead by the leading candidate. The system was also not flexible enough to allow the lowering of threshold for certain position while still elevating the results for the other positions.

## **3. Antipolo PCOS Incident**

In Antipolo City, 60 PCOS machines were discovered in the residence of a Smartmatic/TIM technician. The technician apparently did not return the PCOS machines to Smartmatic/TIM, and kept the PCOS machines in his house, showing a clear lack of protocol on the retrieval and return of the PCOS machines after Election Day. The issue was somewhat overblown, since Smartmatic/TIM still owns the PCOS machines as long as COMELEC has not exercised the purchase option.

## **4. Cagayan de Oro CF Card Incident**

In Cagayan de Oro City, two plastic sacks containing election paraphernalia and other election related materials were found in a junk yard and were given to a PPCRV coordinator for safekeeping. This was eventually reported to COMELEC and later brought to Manila and checked for its authenticity. This incident is attributed to the very lax security measures on election materials by COMELEC local offices. It also showed a lack of transparency, since the report of the loss was done only after the lost election materials were found in the junk yard a week after Election Day.

## **5. Protest Cases**

Numerous protest cases have been filed with the COMELEC by losing candidates with allegations of fraud, discrepancy, vote buying and vote rigging. This was expected, because this was the only recourse of losing candidates to contest the proclamations of their rivals. These cases, regardless of their merit, will once again put the accuracy and effectiveness of the AES to the test.

## **D. Other Issues**

There were numerous other minor issues surrounding the AES, including the performance of the PCOS machines, proper dissemination and implementation of procedures, capability of BEIs and Smartmatic/TIM technicians, just to name a few. The experience that COMELEC has gained from the 2010 elections will help address these types of issues in future elections.

## **X. Assessment of User Experience**

Generally, despite all the criticism that the AES, particularly the PCOS, received from various groups, the voting public, as reported by the PPCRV Diocesan Coordinators, were upbeat about their experience with the first nationwide automated elections in Philippine history. The following are relevant experiences of the voting public:

1. Even though shading was not easy for many, such as the elderly and those with limited IT exposure, they still felt this was a better system since they did not have to write out the names of their candidates, but they found the ballot too long and unwieldy for handling.
2. Apprehensions surrounding the PCOS were overcome by the audio visual presentation "Botong Boto Ka Na Ba," which was circulated in mall tours, school presentations, in-flight program of Philippine Airlines' local flights, departure areas of selected local airports', local bus companies, 3,000 parishes, religious organizations and partner organizations. However, there should have been more time allocated for a thorough voters' education.
3. Voters, particularly the younger ones, were excited to be part of this IT phenomenon, and were especially proud that the Philippines was the first country to attempt automated elections on a nationwide scale in one try.
4. Voters were relieved that the election results came in so quickly, unlike previous manual elections when it would take weeks, even more than a month, to know the winners. It was acknowledged that this helped ease tension and could be a reason for less election related violence.
5. Many BEIs were happy that they had less work to do on Election Day. There was no more tallying of votes, so there was also less harassment and intimidation from those with vested interests, although congestion in clustered polling precincts was a cause of headaches.
6. Poll watchers found it easier to watch the actual voting in an AES, although many would have preferred more exposure to hands on demos of the PCOS and more information on its functions, capabilities and weaknesses.
7. Poll watchers found that the AES created more work, because in addition to their usual poll watching duties, they had to perform other tasks, such as tracking the ballots and PCOS machines, and observing field tests, mock elections, and final testing and sealing.
8. There was a larger turnout of youth volunteers for the PPCRV, probably because they were excited and felt challenged by the new system.

## **XI. Assessment of BEIs**

### **A. Certification Program**

Pursuant to Section 3 of RA 9369, which mandates the Department of Science and Technology (DOST) to certify BEIs on the use of the AES, the DOST



implemented the DOST Certification Program for the BEIs. Under the program, the following support mechanisms were put in place:

1. Project Steering Committee (PSC)

The PSC was constituted from among the heads of concerned DOST agencies. It was responsible for (a) formulating the framework and setting the guidelines for the certification process; (b) recommending certifiers to be officially designated for the program; and, (c) coordinating with the COMELEC on the logistical requirements and the schedules of activities.

2. Project Implementation Staff (PIS)

The PIS, composed of a Program Manager, a Program Management Staff and a Technical Services Staff, assisted the PSC in the performance of its functions.

3. DOST Core Group of Certifiers (CGC)

The CGC was composed of IT personnel from the DOST Central Office and from each of the DOST Regional Offices, including ARMM. They were responsible for (a) participating in the trainers' training conducted by COMELEC and Smartmatic/TIM; (b) developing the DOST Certification Program Protocol and General Instructions; and, (c) briefing the members of the DOST certifiers in their respective regions on the protocol and general instructions.

4. DOST Certifiers

The pool of DOST Certifiers is composed of IT personnel from the DOST Central Office, Regional Offices, Attached Agencies, as well as personnel from other government institutions and state colleges and universities who were detailed to DOST for this purpose. A total of 422 certifiers comprise the pool of DOST Certifiers.

Moreover, the DOST Regional Directors were involved in the implementation of the program and were responsible for, among others, (a) managing the program implementation in their respective regions; (b) closely coordinating with their COMELEC counterparts; (c) entering into agreement in behalf of the DOST Secretary with partner institutions on the detail of the latter's personnel as DOST Certifiers; and (d) the issuance, by authority of the DOST Secretary, of the required certification and documentation for the BEIs.

## **B. DOST Certification Protocol**

To be able to clearly and objectively implement the Program, the DOST Certification Program Protocol and General Instructions (Annex AB) was developed. The protocol prescribed the certification process consisting of the written examination and the practical examination, the guidelines for the conduct of the examinations, the qualification requirement for the members of the pool of

DOST Certifiers and the logistical processes for handling the certification materials.

### C. DOST Certification Process

The DOST certification processes were administered to COMELEC-identified BEIs for the period 1-31 March 2010. A total of 137,200 BEIs were certified from among 151,061 BEIs who took the certification examinations across the country, including ARMM, as well as in Singapore and Hong Kong, for an average passing rate of 91%. Table 1 provides a breakdown of the number of certified BEIs per region (Annex AC).

Moreover, to complete the required number of BEIs, the DOST re-administered certification process on 6 May 2010 to 217 BEIs from the Province of Cavite who previously took the certification process and failed during the initial phase. The re-administration was done upon the request of COMELEC Provincial Office and the COMELEC Program Management Office to be able to meet the remaining requirement for 155 certified BEIs in six (6) municipalities and one (1) city in the province.

Similarly, upon the request of the COMELEC Regional Office X and as endorsed by the COMELEC PMO, the certification process was conducted in Region X last 4 May 2010 to certify new BEIs to replace the previously certified BEIs who have begged off from rendering service on Election Day. A total of 242 BEIs were certified out of the 270 who underwent the certification process.

Further, the DOST administered the certification process for the Special Board of Election Inspectors (SBEIs) for the special elections in the ARMM. The certification process was conducted last 1 June 2010 in Regions X, XI, and XII producing 242, 124, and 146 certified SBEIs, respectively, for a total 512 SBEIs.

## XII. Random Manual Audit

Pursuant to Section 29 of RA 9369, the AES shall be subjected to a random manual audit (RMA) in one randomly selected precinct per congressional district. A root cause analysis shall be conducted for discrepancies between the automated and manual counts and a manual recount for the precincts affected by the error shall be initiated.

The Random Manual Audit Committee (RMAC) consists of the following individuals:

	<b>Name</b>	<b>Organization</b>
Chairman:	Amb. Henrietta T. de Villa	Parish Pastoral Council for Responsible Voting
Members:	Ma. Agnes Carreon	Commission on Elections – Internal Audit Office
	Carmelita N. Ericta	National Statistics Office

The COMELEC increased the number of precincts to be subjected to the RMA to five precincts per congressional district. To ensure transparency in the selection process of



the five precincts per congressional district, the RMAC used a *tamboli* with ping pong balls and conducted the selection in front of the media on Election Day.

The RMA plays an important role as the final validation of the accuracy of the results generated by the AES. A certain amount of discrepancy is to be expected due to human error, but major discrepancies shall be thoroughly investigated, particularly those with patterns favoring specific candidates. As of the time of this report, the RMAC had not yet completed its final RMA report due to delays in the root cause analysis.

### **XIII. Overseas Absentee Voting (OAV)**

Two countries were selected for the automated OAV: Hong Kong and Singapore. For both countries, PPCRV formed a unit of poll watchers. PPCRV Chairperson Amb. Henrietta T. de Villa went to Hong Kong on 8 April 2010 to give an instant poll-watchers' training to around seven (7) overseas Filipino worker (OFW) volunteers through the Couples for Christ and Religious Sister organizations.

At the start of the OAV on 10 April 2010, Amb. de Villa alternately watched five (5) out of twenty (20) clustered polling precincts. Five (5) other volunteers came to watch the rest of the polling centers. Voting in Hong Kong was very well organized and orderly as the SBEIs were well-trained. The 20 sets of SBEIs (60 persons in all) were composed of 20 Consulate personnel and 40 Filipinos belonging to different communities.

At the start of the election period, two (2) PCOS machines malfunctioned and kept on rejecting ballots. Upon replacement of the machines, one machine worked while the other one was replaced twice before it functioned properly. This incident was attributed by Smartmatic/TIM technicians to extreme temperature change as it was very cold the previous day during the testing and sealing, and quite hot on Election Day. This affected the ballots and the machines as the window of that particular room was inadvertently left opened overnight.

Out of 95,355 registered voters in Hong Kong, 39,418 (41.3%) were able to vote. Expiration of working permits of OFWs every two years was pointed out as one of the reasons for the low turnout of voters. The Consulate cannot keep track of all the constant movement of OFWs, including departures and changes of address, unless they notify the Consulate. Estimated turnout by the Consulate prior to voting was 40,000-45,000 voters.

As an overall assessment, the automated OAV was successful due to the following:

- Consulate officials and staff devoted long preparation time and focus on details, such as flow of crowd, voters' education, and announcements via print, radio and TV. Long queues were observed during Sundays, the day-off of OFWs, but there was no unruly behavior, confusion, or frayed tempers.
- Exhaustive training of SBEIs who mastered their tasks with competence, pleasant demeanor, and dedication.

- Admirable commitment, positive attitude and interested involvement of the Filipino communities who were very organized themselves.

#### **XIV. Recommendations**

##### **A. Timing**

1. The COMELEC should start preparations for the May 2013 elections right away to give itself more breathing room. Since the COMELEC is contemplating automating the 2011 ARMM elections as well, it may be a good idea to create separate teams to handle the two elections, which may be a challenge given the limited number of IT personnel in the COMELEC. The budget for the May 2013 elections should also be included in the 2012 regular budget of the COMELEC, so COMELEC should already have an idea of the technology to be used and the corresponding budget requirements by mid-2011.

##### **B. Procurement Process**

1. The COMELEC should ensure that the procurement of the AES for the May 2013 elections will be conducted as transparently as the one for the May 2010 elections, even for smaller procurements such as the ballot boxes, ballot secrecy folders and UV lamps. It should be wary of attempts to delay the procurement process by individuals or groups within COMELEC in order to circumvent the requirements of competitive bidding.
2. The COMELEC should include all components in the original bid, so it will not be surprised by additional procurements later in the process. While the winning bid for the AES was 4 billion pesos below the 11.3 billion peso budget, additional procurements such as the ballot boxes, ballot logistics, and ballot box transportation services practically used up the remaining balance.
3. The COMELEC should waive the 60% Filipino ownership requirement for bidders as provided for in the IRR of RA 9184, since no Filipino companies have the proven capability to conduct nationwide automated elections. Forcing foreign companies to partner with local companies only complicates the procurement process and implementation. In the May 2010 elections, it seemed Smartmatic practically did all the work while TIM was simply present to comply with the 60% requirement. TIM even nearly derailed the entire exercise by threatening to walk away during the contract negotiations with COMELEC.

##### **C. Implementation**

1. The COMELEC should revisit the clustering of precincts. The increase in precinct size from 200 to 1,000 registered voters without the corresponding increase in manpower complement or voting space was the main culprit for the long lines at the precinct that frustrated voters. However, this should be balanced with the need to minimize the number of machines in order to lower the cost of the project.



2. The COMELEC should work with the vendor to establish a better quality control system that will prevent the many errors that were encountered during the May 2010 elections. For example, the CF card configuration issue should have been uncovered much earlier in the process. Some of these problems were also the result of a tight schedule, so better time management will also help.
3. The COMELEC should centralize the CCS in one server instead of distributing it across all canvassing centers. Municipal, provincial and national BOCs should merely be downloading data from the central CCS instead of consolidating their own data. This would ensure that everyone would be working with the same set of data and will also lessen the vulnerability of the CCS to sabotage or manipulation. The CAC believes this does not violate RA 9369, because transmitting results to a central CCS and allowing the BOCs to access them is technologically equivalent as transmitting the results to the BOCs directly.
4. The COMELEC should begin working with the telecom operators to ensure full transmission coverage of precincts in the next election. It should already prepare the clustering of precincts and provide this information to the telecom operators, so they can direct their deployments in the proper areas.
5. The COMELEC should better prepare the BEIs to conduct the random manual audit (RMA) prescribed by RA 9369. The RMA for the May 2010 elections has still not been completed after almost two months, which diminishes the credibility of the results. BEIs should be better informed of the RMA procedures and the conduct of the RMA should be included in BEI training.
6. The COMELEC should find ways to shorten the ballot. One possible solution would be to use a numerical system for the party list candidates. For example, each party list would be assigned a three-digit number and the voter would merely have to shade the ovals corresponding to the three digits. This would address ballot secrecy, ballot printing and ballot logistics issues brought about by an excessively long ballot.
7. The COMELEC should seek advice from the CAC on key technical matters instead of just relying on their internal team. In many instances, the COMELEC did not consult the CAC and ended up making poor decisions that compromised the integrity of the AES. The COMELEC is free to accept or decline the advice of the CAC anyway.
8. The COMELEC should involve the CAC more in the entire process. As provided by RA 9369, CAC members (except those representing ICT professional organizations) are designated as non-voting members of the Bids and Awards Committee (BAC) and Steering Committee. However, CAC members were not included in all BAC activities, particularly in procurements other than the AES. Also, Steering Committee meetings were frequent in the beginning, but became less frequent toward the end of the project.

#### **D. Capacity Building**

1. The COMELEC should designate a high level chief information officer (CIO) with at least third level rank to be responsible for all ICT initiatives, including election automation. This will give the COMELEC an ICT-capable person with a big picture view and sufficient influence within the organization to implement large ICT projects.
2. The COMELEC should strengthen its IT Department, especially since automated elections are now expected to be a regular occurrence. It should increase the size of the department and improve the quality of the personnel. The COMELEC can consider requesting that employees in the IT Department be exempted from the salary standardization law so it can hire the best talent.

#### **E. Proposed Changes in Legislation**

1. Congress should pass a law allowing early voting in election hot spots. In the 2010 elections, election violence in several towns in Lanao del Sur caused COMELEC to declare a failure of elections. By allowing these areas to vote earlier, the law enforcement agencies will be able to focus their efforts on these areas.
2. Congress should pass a law authorizing COMELEC to conduct a general registration for voters that have not done biometric registration. The identity verification process in the May 2010 election was still manual and was therefore susceptible to cheating. By completing the biometric registration, COMELEC will be able to implement a biometric-based identity verification at the precinct that will eradicate some types of fraud such as flying voters and ballot stuffing.

#### **F. Option to Purchase**

1. The CAC recommends that the COMELEC **NOT** exercise the option to purchase the AES. The AES encountered too many problems that need to be resolved before this particular system can be used again. Also, the savings of approximately 2 billion pesos versus leasing the machines again is negated by the costs of storage, breakage and obsolescence. However, the CAC believes that a paper-based solution with automated counting and scanning features is a good fit for Philippine elections and recommends a similar technology be used in the May 2013 elections.

### **XV. Conclusion**

The automation of the May 2010 elections showed what impact technology can have on bringing about electoral reform in the Philippines. It also showed the wisdom of the lawmakers, who crafted RA 9369 to put pressure on the COMELEC to automate the elections. Finally, it showed the commitment and resolve of the COMELEC Chairman and Commissioners and the members of the COMELEC Advisory Council, who tirelessly pushed for the automation despite all the opposition and criticism.



It was not a perfectly executed exercise by any stretch of the imagination. The preparation time was too short for a project of this magnitude and complexity and gave the COMELEC very little room to work with. Smartmatic/TIM committed numerous mistakes throughout the process, some of which nearly derailed the entire automation exercise. The COMELEC also made several questionable decisions that placed the integrity of the AES in jeopardy. There were certainly periods when it appeared the doomsayers were right.

However, after the dust settled and a new President was proclaimed, many of the fears surrounding election automation were put to rest. The COMELEC Advisory Council believes that despite all the mistakes committed by the COMELEC and Smartmatic/TIM, the AES ultimately did work. There were numerous claims of electronic fraud committed by the AES, but to date none of them have been substantiated. While the AES did not eradicate all forms of electoral fraud, it was able to remove the most damaging type—the *dagdag-bawas* (add-subtract). The other forms of electoral fraud that persisted, such as vote buying and ballot stuffing, were prevalent even in the manual elections and cannot be attributed to the AES. With improvements in the implementation and some changes in legislation, even these other types of electoral fraud can be minimized.

For the May 2013 elections, the COMELEC does not need to use the same PCOS machines, but the basic technology appears to be a good fit for the Philippines. The paper based solution is easy to use even for non-IT literate people, and the paper ballots and scanning feature provide an audit trail in the event of electoral protests. The real-time public website for precinct results was also a key feature that built voter confidence and should be used again in future elections. The COMELEC would be better off not exercising the option to purchase on the PCOS machines, so it can look for an even better solution for the May 2013 elections.

Despite the general success of the May 2010 automated elections, we expect the criticisms to continue. Many of these detractors, including losing candidates, self-proclaimed IT experts, and election operators that were put out of business, have ulterior motives, so their opinions should be taken with a grain of salt. What should not happen is for us to use the shortcomings of the May 2010 automated elections to justify a return to manual elections or even hybrid manual/automated systems. We should use the valuable experience we have gained from this milestone exercise to move the country forward instead of backward.